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SAN FRANCISCO INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 1, AIRP--ETC(U)
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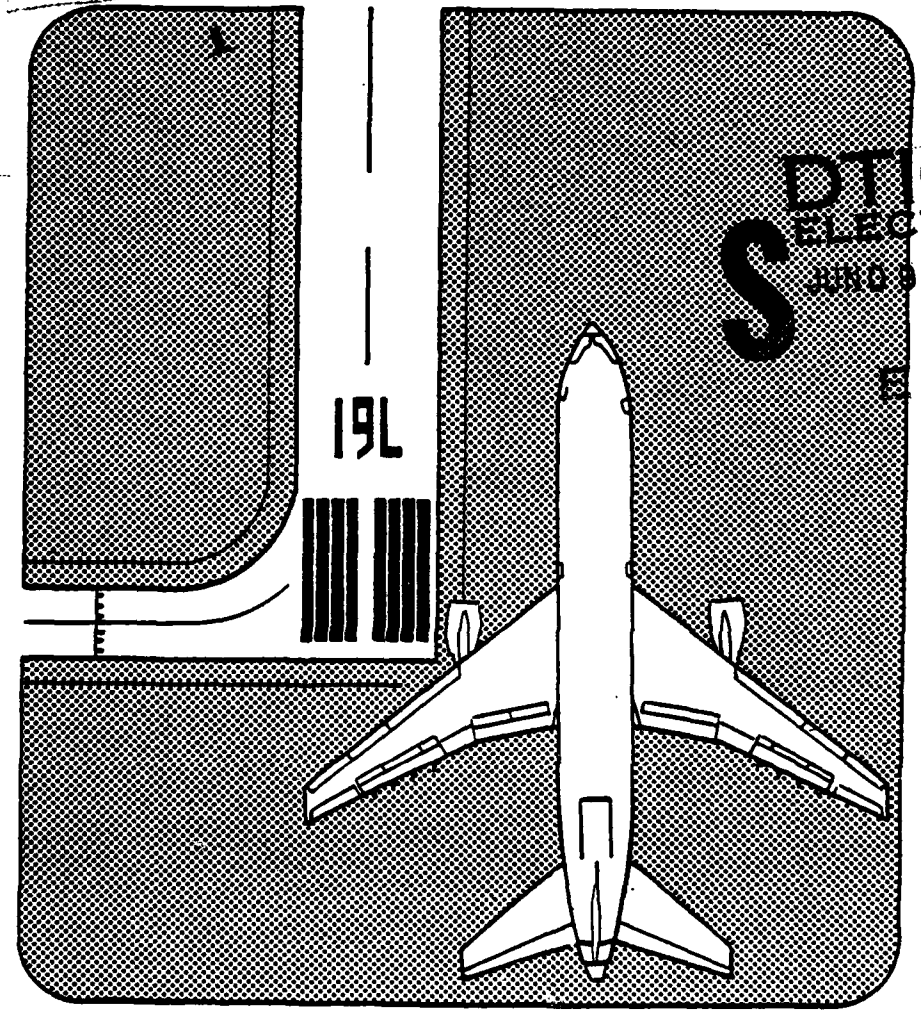
LEVEL II

SAN FRANCISCO INTERNATIONAL AIRPORT

DATA PACKAGE NO. 1,

AIRPORT IMPROVEMENT TASK FORCE DELAY STUDIES



prepared for

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

under contract

DOT-FA77WA—3961

PMM&Co. Peat, Marwick, Mitchell & Co.

JULY 1978

PEAT, MARWICK, MITCHELL & CO.
P. O. BOX 8007
SAN FRANCISCO INTERNATIONAL AIRPORT
SAN FRANCISCO, CALIFORNIA 94128

Telephone: (415) 347-9521

July 21, 1978

Mr. Ray Fowler, AEM-100
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D.C. 20591

Re: Input Data for San Francisco Simulation Model Calibration and Annual Delay Baseline Experiment

Dear Ray:

Enclosed are some data materials for use during the second Task Force meeting on July 24, 1978:

- Attachment A contains the preliminary calibration data package. Additional data are required from the Task Force to complete this package.
- Attachment B contains the preliminary annual delay baseline data package.

These attachments contain information that should be reviewed, revised, and approved by the San Francisco Task Force prior to use in model runs.

Sincerely,

Stephen L. M. Hockaday
Manager

SLMH/sq
Enclosure

cc: Mr. J. R. Dupree (ALG-312) (w/encl)
Mr. B. Chambers (AWE-4) (w/encl)
Mr. R. Mink (AWE-4) (w/encl)

Attachment A

PRELIMINARY CALIBRATION DATA PACKAGE

SAN FRANCISCO INTERNATIONAL AIRPORT

Airport Improvement Task Force Delay Studies

Peat, Marwick, Mitchell & Co.
San Francisco, California

July 1978

INPUT DATA

A. LOGISTICS

1. Title: San Francisco International Airport Airfield Simulation Model Calibration Run

2. Random Number Seeds: 2017, 3069, 4235, 5873, 6981, 7137, 8099, 9355, 0123, 1985.

3. Start and Finish Times: 1600 to 1900 May 16, 1978.

4. Print Options: Detailed run for one random number seed. Summary run for ten random number seeds.

5. Airline Names:

Name	Code
Air California	OC
Air Taxi/Commuter	AT
American	AA
Continental	CO
Delta	DL
Flying Tiger	FT
Hughes Airwest	RW
International	IN
National	NA
Northwest	NW
Pacific Southwest	PS
Trans World	TW
United	UA
Western	WA

6. Processing Options: First run to check model input. Other runs in COMPUTE mode.

7. Truncation Limits: $\pm$ 3 standard deviations.

8. Time Switch: Not applicable.

B. AIRFIELD PHYSICAL CHARACTERISTICS

9. Airfield Network: See Figure 1.

10. Number of Runways: 4.

11. Runway Identification: 1L, 1R, 28L and 28R.

12. Departure Runway End Links: 429, 436.

13. Runway Crossing Links: 252, 248, 322, 168, 167, 120, 119.

14. Exit Taxiway Location: To be based on existing airfield configuration and only those exits used during field data collection for calibration.

15. Holding Areas: To be determined.

16. Airline Gates: Not applicable.

17. General Aviation Basing Areas: Butler Aviation.

C. ATC PROCEDURES

18. Aircraft Separations: These values are based on Report No. FAA-EM-78-8A.

Arrival-Arrival Separation (n.m.)

		Trail Aircraft Class			
		A	B	C	D
Lead Aircraft Class	A	1.9	1.9	1.9	1.9
	B	1.9	1.9	1.9	1.9
	C	2.7	2.7	1.9	1.9
	D	4.5	4.5	3.6	2.7

Departure-Departure Separations (seconds)

		Trail Aircraft Class			
		A	B	C	D
Lead Aircraft Class	A	35	35	45	50
	B	35	35	45	50
	C	50	50	60	60
	D	120	120	120	90

Departure-Arrival Separation (n.m.): To be based on reduced field data or departure runway occupancy times.

Arrival-Departure Separation (seconds): To be based on reduced field data or arrival runway occupancy times.

19. Route Data: See Figure 2.

20. Two-Way Path Data: Two-way flows occur on connectors between Taxiways A and B.

21. Common Approach Paths:

Arrival Runway	Aircraft Class	Length of Common Approach Path
28L	A	2.0
	B	2.0
	C	5.0
	D	5.0
28R	A	2.0
	B	2.0
	C	5.0
	D	5.0

22. Vectoring Delays:

This input allocates delays among vectoring and holding. Model input values will be used that hold arrival aircraft if delays to arrival aircraft exceed 10 minutes.

23. Departure Runway Queue Control:

Aircraft are assigned departure runways to preclude airspace crossovers, not to balance departure queues.

24. Gate Hold Control:

Aircraft are held at gates when departure queue at runway is 10 or more, except when gate holds would cause gate congestion.

25. Departure Airspace Constraints:

Aircraft are not held at gates due to departure airspace constraints.

26. Inter-Arrival Gap:

With this runway use, arrival aircraft are delayed in the arrival airspace when departure delays exceed 15 minutes.

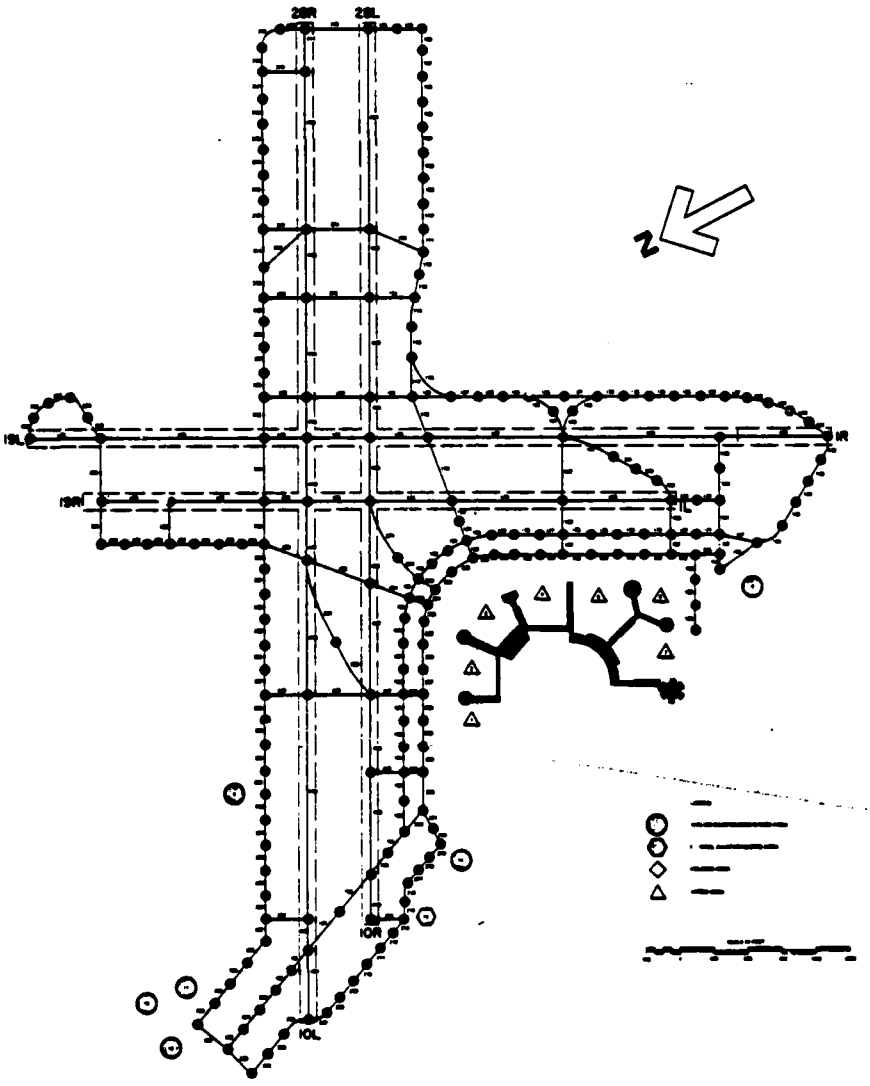


Figure 1

AIRFIELD NETWORK

SAN FRANCISCO INTERNATIONAL AIRPORT

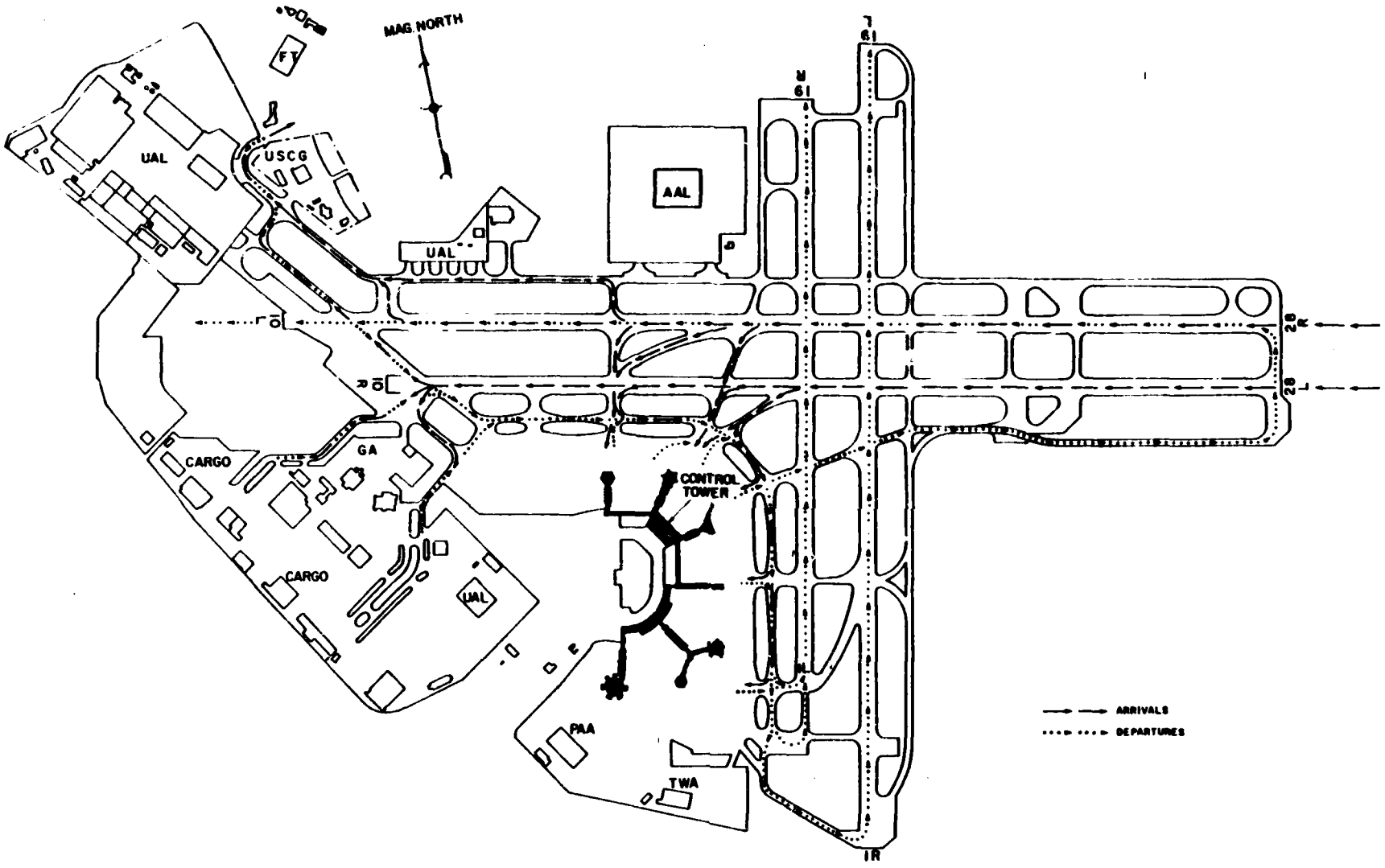


Figure 2. ARRIVAL/DEPARTURE TAXI ROUTES

27. Runway Crossing Delay Control:

Arrival and departure runway operations are only interrupted for a taxiing aircraft to cross an active runway when the taxiing aircraft is delayed by 10 minutes or more.

D. AIRCRAFT OPERATIONAL CHARACTERISTICS

28. Exit Taxiway Utilization:

	Exit Utilization (percent) A/C Class	E	T	D	U
Runway 28R	A		15		85
	B	15			85
	C	63	27	3	7
	D	23	77		

	Exit Utilization (percent) A/C Class	J	E	D	R
Runway 28L	A				100
	B	100			
	C	88	5	5	2
	D	88		12	

29. Arrival Runway Occupancy Times:

	Runway Occupancy Time (seconds) A/C Class	E	T	D	U
Runway 28R	A		80		95
	B	64			102
	C	55	60	92	105
	D	54	54		

	A/C Class	J	E	D	R
Runway 28L	A				75
	B	56			
	C	46	54	63	102
	D	47		75	

30. Touch & Go Occupancy Times: Not applicable.

31. Departure Runway Occupancy Times:

Aircraft Class	Runway Occupancy Time (seconds) Mean	Standard Deviation
A	34	4
B	34	4
C	39	4
D	39	4

32. Taxi Speeds: To be based on reduced field data.

33. Approach Speeds:

Aircraft Class	Approach Speed (knots) Mean	Standard Deviation
A	95	10
B	120	10
C	130	10
D	140	10

34. Gate Service Times: Not applicable.

35. Airspace Travel Times: To be based on reduced field data.

36. Runway Crossing Times: To be based on reduced field data.

37. Lateness Distribution: Not applicable.

38. Demand: To be based on reduced field data.

OUTPUT DATA

A. FLOW RATES: To be based on reduced field data.

B. DELAYS: To be based on reduced field data.

C. TRAVEL TIMES: To be based on reduced field data.

Attachment B

PRELIMINARY ANNUAL DELAY BASELINE DATA PACKAGE

SAN FRANCISCO INTERNATIONAL AIRPORT

Airport Improvement Task Force Delay Studies

Peat, Marwick, Mitchell & Co.
San Francisco, California

July 1978

1. Annual Demand: 349,011 (1977)

2. Group Specification:

3 day groups	:	High, Average, Low
12 week groups	:	12 months, January through December
4 weather groups	:	VFR1, VFR2, IFR1, IFR2

7 runway uses :		Arrivals Runway	Departures Runway
	1.	28 L/R	1 L/R
	2.	28 L or R	1 L/R
	3.	28 L/R	1 L or R
	4.	28 L/R	28 L/R
	5.	19 L/R	10 L/R
	6.	19 L/R	19 L/R
	7.	Other*	Other*

3,4. Traffic Distribution:

Week Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% of annual in one week	1.79	1.79	1.90	1.91	1.86	1.97	2.02	2.05	1.99	1.95	1.93	1.84
Number of weeks in month	4.43	4.00	4.43	4.29	4.43	4.29	4.43	4.43	4.29	4.43	4.29	4.43
% of annual in month	7.90	7.14	8.40	8.15	8.21	8.42	8.92	9.05	8.80	8.62	8.26	8.13

5,6. Daily Traffic Distribution:

Day Group	High	Avg	Low
% of weekly in one day	15.1	14.1	12.3
Number of days	3	3	1
% of weekly traffic in day group	45.3	42.4	12.3

*Includes Land 10 L/R, Depart 10 L/R and Land 1 L/R, Depart 1 L/R.

7. Weather Occurrences:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% VFR1	76	83	80	89	80	80	80	72	76	84	84	69
% VFR2	16	10	18	8	15	15	13	15	15	12	11	14
% IFR1	3	1	1	2	2	3	3	5	3	1	1	4
% IFR2	5	6	1	1	3	2	4	8	6	3	4	13

8. Hourly Runway Capacity Parmeters:

Runway Use	Hourly Capacity[a] (Operations/hour) VFR1	VFR2	IFR1	IFR2
1	111	89	53	(b)
2	(b)	(b)	(b)	(b)
3	(b)	(b)	(b)	(b)
4	98	96	63	(b)
5	97	97	63	(b)
6	(b)	64	48	36
7	(b)	(b)	(b)	(b)

9. Runway Use/Weather Group Demand Factors:

For all runway uses:

Weather VFR1	VFR2	IFR1	IFR2
1.0	1.0	0.98	0.81

10. Runway Use Occurrences:[c]

Runway Use	Percent Occurrence VFR1	VFR2	IFR1	IFR2	All Weather
1					67(d)
2					
3					
4			(c)		25
5					6
6					1
7					1
All Runways	79.2	13.4	2.7	4.7	100

(a) Federal Aviation Administration, San Francisco International Airport Staff-ATA-Airlines serving San Francisco-*San Francisco International Airport Operations Improvement Program-Interim Report*-September 1977.

(b) To be estimated by Task Force with PMM&Co. assistance.

(c) To be estimated by Task Force.

(d) Includes % for cases 2 and 3 which are to be estimated by Task Force.

11. Hourly Traffic:

Hour	% Daily Traffic	Hour	% Daily Traffic	Hour	% Daily Traffic	Hour	% Daily Traffic
00-01	2.6	06-07	1.6	12-13	7.1	18-19	5.5
01-02	1.6	07-08	4.6	13-14	6.6	19-20	6.2
02-03	0.9	08-09	6.1	14-15	6.4	20-21	5.1
03-04	0.7	09-10	6.2	15-16	5.2	21-22	3.8
04-05	0.4	10-11	5.7	16-17	5.0	22-23	3.9
05-06	1.0	11-12	6.0	17-18	5.2	23-24	2.6

12,13. Delay Curve Specification: To be determined after airfield simulation runs.

14. Percent Arrivals:

Hour	% Arrivals	Hour	% Arrivals	Hour	% Arrivals	Hour	% Arrivals
00-01	44	06-07	34	12-13	49	18-19	59
01-02	43	07-08	43	13-14	46	19-20	57
02-03	60	08-09	40	14-15	49	20-21	62
03-04	67	09-10	40	15-16	49	21-22	57
04-05	65	10-11	51	16-17	52	22-23	44
05-06	50	11-12	61	17-18	46	23-24	65

15. Cancellation Diversion Specification: To be provided by Task Force.

16. User-Specified Title: SFO ANNUAL BASELINE.


DATE
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